

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE
THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of:	Warburton)	
)	
Serial No.:	10/668,537)	
)	
Filed:	September 23, 2003)	
)	Art Unit
For:	X-RAY DEVICE COMPONENT WITH)	
	EMISSIVE INORGANIC COATING)	1775
)	
Examiner:	Aaron Austin)	
)	

The Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

**REPLY BRIEF OF APPELLANT
PURSUANT TO 37 CFR 41.41**

This Reply Brief is responsive to the Examiner's Answer mailed 06 March 2007 and is hereby submitted to the Board of Patent Appeals and Interferences (the "Board") pursuant to the provisions of 37 CFR 41.41.

TABLE OF CONTENTS

U.S. Patent Documents.....	3
I. GROUND OF THE REJECTIONS TO BE REVIEWED ON APPEAL	3
II. REPLY TO EXAMINER ARGUMENTS	4
III. FORM OF AMENDED BRIEF OF APPELLANT	26

LIST OF REFERENCES

U.S. Patent Documents

U.S. Patent No. 3,400,882 to *McMamus* (“*McMamus*”)
U.S. Patent No. 6,329,098 to *Bliesner* (“*Bliesner*”)
U.S. Patent No. 5,725,808 to *Tormey et al.* (“*Tormey*”)

I. GROUNDS OF THE REJECTIONS TO BE REVIEWED ON APPEAL

- Issue 1: Whether claims 1-36 are unpatentable under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.
- Issue 2: Whether claims 1-2, 4-15 and 17-19 are unpatentable under 35 U.S.C. §102(b) as being anticipated by *McMamus*.
- Issue 3: Whether claims 1-2 and 4-10 are unpatentable under 35 U.S.C. §102(b) as being anticipated by *Bliesner*.
- Issue 4: Whether claims 1-2, 4-15 and 17-19 are unpatentable, under 35 U.S.C. §103(a), over *McMamus*.
- Issue 5: Whether claims 1-2 and 4-10 are unpatentable, under 35 U.S.C. §103(a), over *Bliesner*.
- Issue 6: Whether claims 3, 16 and 20-26 are unpatentable, under 35 U.S.C. §103(a), over *McMamus* as applied to claims 1-2, 4-15 and 17-19, and further in view of *Tormey*.
- Issue 7: Whether claim 3 is unpatentable, under 35 U.S.C. §103(a), over *Bliesner* as applied to claims 1-2, and further in view of *Tormey*.

II. REPLY TO EXAMINER ARGUMENTS

Applicant notes at the outset that the remarks, or a lack of remarks, herein are not intended to constitute, and should not be construed as, an acquiescence on the part of the Applicant: as to the purported teachings or prior art status of the cited references; as to the characterization of the cited references advanced by the Examiner; or as to any other assertions, allegations or characterizations made by the Examiner at any time in this case.

A. Issue 1: Whether claims 1-36 are unpatentable under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.

With regard to the rejection of claims 1-36 under 35 U.S.C. § 112, first paragraph, the Examiner maintains in the Examiner's Answer mailed March 6, 2007 (the "Examiner's Answer") that those claims are rejected as failing to comply with the enablement requirement. In connection with that statement, the Examiner sets forth several grounds upon which the rejection is based. Notwithstanding the arguments advanced by the Examiner, Applicant submits that the aforementioned rejection of claims 1-36 lacks merit for a variety of reasons.

1. The Examiner has failed to demonstrate performance of the analysis required under the applicable legal standard

For the first time, in the Examiner's Answer (see *Examiner's Answer* at 10), the Examiner addresses Applicant's argument, made repeatedly throughout the prosecution of this case and never acknowledged by the Examiner until now, that the Examiner has failed to perform the requisite analysis required to support a *prima facie* showing of a lack of enablement. See *Amended Brief of Appellant* at 7-9 ("Amended Brief").

In particular, the Examiner has responded to the aforementioned arguments by Appellant not with evidence and analysis, but simply by asserting that "...the numerous factors associated with undue experimentation provided by In re Wands have been taken into account and in weighing the factors the specification was found to be insufficient..." *Examiner's Answer* at 9. *Emphasis added.* Applicant notes, however, that other than this single conclusory assertion, there remains no evidence on the record that the Examiner has considered all of the various factors required to be addressed in connection with an enablement analysis.

In this regard, Applicant submits that while the Manual of Patent Examining Procedure (“MPEP”) 2164.04 provides that “...it is not necessary to discuss each factor in the written enablement rejection...”, it is clear on the other hand that the notion that an Examiner could discharge his burden, as to the required analysis of the numerous factors pertaining to undue experimentation, by the simple expedient of a single conclusory assertion is plainly inconsistent with the rigorous analytical scheme articulated by the U.S. Supreme Court in *Mineral Separation v. Hyde*, 242 US 261, 270 (1916) and confirmed in *In Re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

Inasmuch as the Examiner has failed to adduce any evidence, beyond the single conclusory assertion newly advanced in the Examiner’s Answer, demonstrating that the Examiner has given due consideration to all of the factors associated with an analysis concerning undue experimentation, the Examiner has thus failed to establish a lack of enablement with respect to the claimed invention. Applicant thus submits that the rejection of claims 1-36 under 35 U.S.C. § 112, paragraph 1 is fatally flawed and should be reversed by the Board. Moreover, and as discussed below, consideration of factors not addressed by the Examiner compels the conclusion that, in fact, Applicant’s disclosure is enabling.

2. The state of the art, as defined by the Examiner, corresponds with a relative reduction in the required scope of Applicant’s disclosure

With respect to the enablement requirement, Applicant respectfully notes that ‘the state of the prior art’ is one factor that must be considered in an assessment of whether or not a disclosure is enabling. See, e.g., MPEP 2164.01(a). As to this factor, Applicant notes that “The amount of guidance or direction needed to enable the invention [factor ‘F’ of the undue experimentation factors] is inversely related to the amount of knowledge in the state of the art [factor ‘C’ of the undue experimentation factors] as well as the predictability in the art.” *MPEP 2164.03* (citing *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970)). *Emphasis added*. That section goes on to explain that “The ‘amount of guidance or direction’ refers to that information in the application, as originally filed, that teaches exactly how to make or use the invention. The more that is known in the prior art about the nature of the invention, how to make, and how to use the invention, and the more predictable the art is, the less information needs to be explicitly stated in the specification.” *Id. Emphasis added*. Finally, “The test of enablement is whether one reasonably skilled in the art could make or use the invention from the

disclosures in the patent coupled with information known in the art without undue experimentation.” *United States v. Teletronics Inc.*, 857 F.2d 778, 785, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991).

In the present case, the Examiner has repeatedly taken the position that one of skill in the art could make or use the claimed invention based upon nothing more than what is purportedly disclosed in the art. For example, in rejecting claims 1-2 and 11-15 under 35 U.S.C. §§ 102(b) and 103(a), the Examiner has stated that “With respect to claims 1-2 and 11-15, McManus discloses a vacuum chamber comprising a coating of ceramic material covers the interior of the ion pump chamber. The walls of the pump may be a metallic material such as stainless steel. The ceramic coating may be any suitable ceramic for high vacuum environments and is not porous and has a glazed surface exposed to the interior of the vacuum chamber (col. 3 lines 60-75).” *Office Action mailed February 4, 2005* (“Office Action 2/4/05”) at 4. *Emphasis added.* In that same action, the Examiner further stated that “With respect to claims 1-2, Bliesner discloses a component comprising stainless steel coated with an electrically insulating ceramic (col. 3, lines 1-30).” *Id.* As another example, the Examiner has alleged with respect to claim 3 that “...it would have been obvious to one of ordinary skill in the art to add oxide filler [as purportedly taught by Tormey] to the ceramic coating of Bliesner to improve the properties of the ceramic coating such as reduced shrinkage and have a low firing temperature.” *Office Action 2/4/05* at 7. *Emphasis added.* See also *Office Action mailed August 19, 2005* 9 (at 3, and 6) and the *Office Action mailed March 13, 2006* (at 3-4, and 6, also referring to *Hawley’s Condensed Chemical Dictionary* at 231).

Thus, the Examiner has, at least implicitly, taken the position that the state of the art with which the claimed invention is purportedly concerned is sufficiently advanced that the claimed invention is anticipated and/or obvious in view of the references of record. In view of the fact that the Examiner has characterized the state of the art [factor ‘C’] as being relatively advanced, and in view of the inverse relationship between factors ‘F’ and ‘C’ of the undue experimentation analysis, it seems clear from the examination guidelines and case precedents that the required scope of Applicant’s disclosure [factor ‘F’] is correspondingly reduced. See, e.g., *MPEP 2164.03* (citing *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970)). As noted earlier herein however, there is no evidence on the record indicating that the Examiner has given due consideration to the state of the art in reaching the conclusion that the disclosure of the

present application is not enabling. Applicant submits that, for at least this reason, the rejection of claims 1-36 under 35 U.S.C. § 112, paragraph 1 should be reversed by the Board.

3. The Examiner has incorrectly suggested that there is a *per se* rule that the claimed composition be disclosed for the claims to be enabled

In the Examiner's Answer, the Examiner maintains the position that "Without knowledge of the compositions represented by the trademarks/trade names, one of ordinary skill in the art is not provided with sufficient information to practice the invention as trademark/trade names may represent any number of individual products over time having any number of physical properties." *Examiner's Answer* at 9.

The Examiner goes on to suggest that regardless of the quantum of Applicant's disclosure, that disclosure is not enabling unless specific chemical compositions are disclosed. In particular, the Examiner has stated that "...appellant points to the reply of February 21, 2006 at pages 8-9 and the specification at pages 8 and 17 as providing ample scientific and explanatory language...[to enable one of skill in the art to make and use the claimed invention without undue experimentation]. However, the cited language provides properties of the material but is insufficient in identifying the actual material itself..." *Examiner's Answer* at 10. The Examiner later reiterates that "As the appellant has not provided a recognized chemical formula or nomenclature...it is the Examiner's position that the claims are not enabled." *Examiner's Answer* at 12. Applicant disagrees.

Applicant notes at the outset that in making the aforementioned assertions, the Examiner has again failed to properly state the test for enablement, omitting any reference to the requirement that any experimentation required to practice the invention be 'undue.' *Id.* See also, *Id.* ("...a rejection under the First paragraph looks for support in the specification for the claimed invention such that one of ordinary skill in the art is enabled for carrying out the invention upon reading the application..." *Emphasis added.*). In fact, neither of the foregoing is a correct statement of the legal standard to be applied in evaluating enablement.

Moreover, Applicant notes as well that beyond the conclusory assertion that "...one of ordinary skill in the art is not provided with sufficient information to practice the invention..." (*Id.*), the Examiner has advanced no evidence or analysis in support of the allegation that Applicant's disclosure is not enabling. In fact, there is nothing on the record to indicate that the Examiner has given due consideration as to whether the scientific and explanatory language

referred to at pages 9-10 of *Applicant's Amended Brief* enable the claimed invention. Rather, in view of the repeated references of the Examiner to the purported requirement that a chemical formula be disclosed (see, e.g., *Examiner's Answer* at 9, 10 and 12), it appears that the position of the Examiner rests solely on the incorrect notion that a disclosure is not enabling with respect to a claimed composition unless specific chemical formulae are disclosed. As discussed below however, the Examiner has not demonstrated the existence of any such *per se* rule, and the rejections of the Examiner based upon that notion are, accordingly, fatally flawed.

Not only has the Examiner failed to identify any basis in the law for the implicit assertion that a disclosure relating to a claimed chemical composition *per se* fails to enable if that disclosure does not include a chemical formula but, in fact, there is precedent supporting the notion that a chemical formula is not necessarily required for enablement. For example, the court in *In re LeGrice*, 301 F.2d 929 (CCPA 1962) noted that for a reference to anticipate a claimed invention, the reference must set forth an enabling disclosure. *Id.* at 935. While the present case is not concerned with whether or not a particular reference is enabling, the discussion of the court with respect to the scope of disclosure necessary for enablement is nonetheless instructive. In particular, the court stated in that regard that “Written descriptions and drawings ... can often enable others to manufacture the article, practice the process or produce the chemical composition.” *Id.* *Emphasis added.* Thus, *In re LeGrice* provides that a written description in a disclosure can enable one of ordinary skill in the art to produce a [claimed] chemical composition. Applicant notes that the vitality of *In re LeGrice* in this regard was not disputed in a subsequent Federal Circuit case citing the aforementioned language of *In re LeGrice*. See *In re Elsner*, 381 F.3d 1125, 1130 (Fed. Cir. 2004).

With the foregoing points in view, Applicant submits that it is clear that the implicit suggestion of the Examiner that a disclosure is *per se* non-enabling if that disclosure does not disclose specific chemical compositions is contrary to Federal Circuit precedent. Moreover, *In re LeGrice* makes clear that a written [or ‘textual’ – see *Id.*] description may well be adequate to enable the practice of a claimed chemical composition. In the present case, however, the Examiner has simply failed to make a *prima facie* demonstration that the description set forth in the present application is not enabling with respect to the claimed coatings. As noted above, the rejection of the Examiner appears to be based, instead, on the incorrect notion that irrespective of

its breadth and depth, a disclosure is *per se* not enabling unless specific chemical formulae are disclosed.

Insofar as the rejection of claims 1-36 is based upon the incorrect notion that a disclosure is not enabling unless specific chemical compositions are disclosed, and in view of the evident failure of the Examiner to consider whether the written description set forth in the application is adequate to enable the claimed invention, regardless of whether or not specific chemical formulae are disclosed, Applicant submits that the rejection of claims 1-36 under 35 U.S.C. § 112, paragraph 1 lacks an adequate basis and should accordingly be reversed by the Board.

4. The apparent suggestion of the Examiner that Applicant is relying only on trademarks/trade names for enablement is incorrect

The Examiner has stated that “In the present case, the rejection states that the claims are not enabled by the specification due to the use of trademarks/trade names to represent and enable the claimed coating material without clearly identifying the material itself. MPEP 608.01 (v) [R-2] supports this analysis by stating a disclosure relying only on trademarks/trade names is insufficient.” *Examiner’s Answer* at 11. The Examiner has further stated that “As the appellant has not provided a recognized chemical formula or nomenclature to understand the composition of the trademarks/trade names used, it is the Examiner’s position that the claims are not enabled.” *Id.* at 12.

Notwithstanding the aforementioned assertions, Applicant submits that the record is clear that Applicant has not relied solely on trademarks/trade names for enablement of the claims. See, e.g., paragraphs [0033] to [0034] and [0049] to [0055] of the specification. Moreover, the foregoing statements by the Examiner further support the position of the Applicant that the Examiner has failed to give due consideration to the information provided in the disclosure concerning the claimed coating and has, instead, erroneously focused solely on the matter of whether or not specific chemical formulae have been disclosed.

B. Issue 2: Whether claims 1-2, 4-15 and 17-19 are unpatentable under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,400,882 to McManus

1. claims 1-2, 4-15 and 17-19

With regard to the rejection of claims 1-2, 4-15 and 17-19 under 35 U.S.C. § 102(b), Applicant notes that the Examiner has never established that the “ceramic material 11” referred to in *McManus* (col. 3, lines 71-75) comprises an “emissive” material as required by independent claims 1 and 11. In fact, the rejection of claim 1 set forth in the Office Action mailed February 4, 2005, fails to even recite the word “emissive.” In particular, that rejection states:

With respect to claims 1-2 and 11-15, McManus discloses a vacuum chamber comprising a coating of ceramic material covers the interior of the ion pump chamber. The walls of the pump may be metallic material such as stainless steel. The ceramic coating may be any suitable ceramic for high vacuum environments and is not porous and has a glazed surface exposed to the interior of the vacuum chamber (col. 3, lines 60-75).

Office Action 2/4/05 at 4.

In at least one instance, it appears the Examiner has simply assumed that all ceramics are necessarily emissive. In particular, the Examiner has stated “The ceramic coating disclosed by McManus is considered to be the same as the claimed emissive coating...” *Id.* at 5.

Moreover, the Examiner’s Answer fails to provide any support for this assumption. Rather, the Examiner’s Answer addresses “emissive” coatings only tangentially, stating that “...any type of ceramics, which comprise inorganic compounds can be used as the emissive coating.” *Examiner’s Answer* at 13. Other than this conclusory assertion however, the Examiner has advanced no evidence or argument that the ceramics purportedly disclosed in the cited references are “emissive” as contemplated by the claims.

Possibly, the Examiner is implicitly relying on a theory of inherency as a basis for the assertion that the disclosed ceramics, and indeed all ceramics according to the Examiner, are emissive. Applicant respectfully notes, however, that inherency is not readily established.

For example, as noted in MPEP § 2112, the Examiner must provide rationale or evidence showing inherency. In particular, “The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.”

In re Rijckaert, 9 F.3d 1531, 1534 28 USPQ 2d 1955, 1957 (Fed. Cir. 1993) (emphasis in original). Moreover, the Court of Appeals for the Federal Circuit has noted that “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described by the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a thing *may* result from a given set of circumstances is *not sufficient*’.” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ 2d 1949, 1950-51 (Fed. Cir. 1999) (emphasis added).

Finally, “In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex Parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

At least because the Examiner has provided neither rationale nor evidence showing inherency of the claimed “emissive” coating in the cited reference, Applicant submits that the Examiner has failed to establish that claims 1-2, 4-15 and 17-19 are anticipated by *McManus*. Accordingly, Applicant respectfully submits that the rejection of the Examiner should be reversed by the Board.

2. claims 4 and 17

With regard to the rejection of claims 4 and 17 under 35 U.S.C. § 102(b), Applicant notes that the Examiner has never established that the “ceramic material 11” referred to in *McManus* (col. 3, lines 71-75) comprises a “dielectric” material as required by claims 4 and 17. Rather, it appears that the Examiner has simply assumed that the disclosed ceramics are necessarily dielectric. In particular, the Examiner has stated “The ceramic coating [disclosed by *McManus*] is considered to be a dielectric material.” *Office Action 2/4/05* at 4. Moreover, the *Examiner’s Answer* likewise fails to provide any support for this assumption.

If this assumption is not based on personal knowledge (in connection with which Applicant requested, but never received, an Examiner affidavit pursuant to 37 CFR 1.104(d)(2) – see *Applicant’s Amended Brief* at 13), it may instead be the case that the Examiner is implicitly relying on a theory of inherency as a basis for the assertion that the disclosed ceramics, and indeed all ceramics according to the Examiner, are dielectric. As noted at II.B.1 above however, inherency is not readily established. At least because the Examiner has provided neither

rationale nor evidence showing inherency of the claimed “dielectric” coating, Applicant submits that the Examiner has failed to establish that claims 4 and 17 are anticipated by *McMamus*. Accordingly, Applicant respectfully submits that the rejection of the Examiner should be reversed by the Board.

3. claims 7-10 and 18-19

With regard to the rejection of claims 7-10 and 18-19 under 35 U.S.C. § 102(b), Applicant notes that the Examiner has never established that the “ceramic material 11” referred to in *McMamus* (col. 3, lines 71-75): comprises an emissivity of “about 0.6 or higher” (claim 7); comprises an emissivity of “about 0.2 or lower” (claim 8); “substantially prevents oxidation of the coated portion of the body at body temperatures of up to about 1450 degrees F” (claims 9 and 18); or, “substantially prevents corrosion of the coated portion of the body at body temperatures of up to about 1450 degrees F” (claims 10 and 19).

Rather, as discussed above, the Examiner appears to be relying on a theory of inherency in asserting that the aforementioned limitations are disclosed in *McMamus*. Insofar as the Examiner has failed to demonstrate that *McMamus* discloses the claimed “emissive” coating however, the Examiner has, for at least that reason, likewise failed to demonstrate that the aforementioned limitations (recited in claims 7-10 depending from claim 1, and in claims 18-19 depending from claim 11) are inherent in *McMamus*. For at least this reason, Applicant respectfully submits that the rejection of claims 7-10 and 18-19 should be reversed by the Board.

C. Issue 3: Whether claims 1-2 and 4-10 are unpatentable under 35 U.S.C. §102(b) as being anticipated by *Bliesner*

With regard to the rejection of claims 1-2 and 4-10 under 35 U.S.C. § 102(b), Applicant notes that as in the case of the anticipation rejection based upon *McMamus*, the Examiner has never established that the “ceramic coating” referred to in *Bliesner* (col. 3, lines 1-30) comprises an “emissive” material as claim 1 requires.

In fact, the rejection of claim 1 set forth in the Office Action mailed February 4, 2005, fails to even recite the word “emissive.” Rather, that rejection states only that “With respect to claims 1-2, *Bliesner* discloses a component comprising stainless steel coated with an electrically insulating ceramic (col. 3, lines 1-30).” *Office Action 2/4/05* at 5.

In at least one instance, it appears the Examiner has simply assumed that all ceramics are necessarily emissive. In particular, the Examiner has stated “The ceramic coating disclosed by *Bliesner* is considered to be the same as the claimed emissive coating...” *Id.* at 6.

Moreover, the Examiner’s Answer likewise fails to provide any support for this assumption. Rather, the Examiner’s Answer addresses “emissive” coatings only tangentially, stating that “...any type of ceramics, which comprise inorganic compounds can be used as the emissive coating.” *Examiner’s Answer* at 14. Other than this conclusory assertion however, the Examiner has advanced no evidence or argument that the ceramics purportedly disclosed in the cited references are “emissive” as required by the claims.

It would thus appear that the Examiner is relying on a theory of inherency in rejecting claims 1-2 and 4-10 in view of *Bliesner*. As noted at II.B.1 above however, inherency is not readily established. At least because the Examiner has provided neither rationale nor evidence showing inherency of the claimed “emissive” coating, Applicant submits that the Examiner has failed to establish that claims 1-2 and 4-10 are anticipated by *Bliesner*. Accordingly, Applicant respectfully submits that the rejection of claims 1-2 and 4-10 should be reversed by the Board.

D. Issue 4: Whether claims 1-2, 4-15 and 17-19 are unpatentable, under 35 U.S.C. §103(a), over *McManus*.

1. claims 1-2, 4-15 and 17-19

In connection with the obviousness rejection of claims 1-2, 4-15 and 17-19, the Examiner has stated that “...the rejection [of those claims] was made as a 102/103 rejection with respect to inherency.” *Examiner’s Answer* at 15. *Emphasis added*. Notwithstanding, it was noted above at II.B.1 that the Examiner has failed to establish that the “ceramic material 11” referred to in *McManus* (col. 3, lines 71-75) comprises an “emissive” material as required by independent claims 1 and 11. As further discussed at II.B.1, the Examiner has likewise failed to establish that the claimed “emissive” coating is inherent in the disclosure of *McManus*. Thus, regardless of whether the rejection of claims 1-2, 4-14 and 17-19 is styled as a 35 U.S.C. § 102 or 35 U.S.C. § 103 rejection, the reliance of the Examiner on *McManus* is unavailing.

In light of the foregoing, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the claims, at least because the Examiner has failed to show that the reference teaches or suggests all the limitations of the claims, and Applicant accordingly submits that the rejection of claims 1-2, 4-15 and 17-19 should be reversed by the Board.

2. claims 4 and 17

As discussed at II.B.2, the Examiner has not established that the “dielectric” material recited in claims 4 and 17 is disclosed, or inherently present, in *McManus*. Thus, regardless of whether the rejection of claims 4 and 17 is styled as a 35 U.S.C. § 102 or 35 U.S.C. § 103 rejection, the reliance of the Examiner on *McManus* is unavailing.

In light of the foregoing, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the claims, at least because the Examiner has failed to show that the reference teaches or suggests all the limitations of the claims, and Applicant accordingly submits that the rejection of claims 4 and 17 should be reversed by the Board.

3. claims 7-10 and 18-19

As discussed at II.B.3 above, the Examiner has not established that the particular “emissive” materials respectively required by claims 7-10 and 18-19 are disclosed, or inherently present, in *McManus*. Thus, regardless of whether the rejection of claims 7-10 and 18-19 is

styled as a 35 U.S.C. § 102 or 35 U.S.C. § 103 rejection, the reliance of the Examiner on *McMamur* is unavailing.

In light of the foregoing, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the claims, at least because the Examiner has failed to show that the reference teaches or suggests all the limitations of the claims, and Applicant accordingly submits that the rejection of claims 7-10 and 18-19 should be reversed by the Board.

Issue 5: Whether claims 1-2 and 4-10 are unpatentable, under 35 U.S.C. §103(a), over *Bliesner*.

1. claims 1-2 and 4-10

In connection with the obviousness rejection of claims 1-2 and 4-10, the Examiner has stated that “...the rejection [of those claims] was made as a 102/103 rejection with respect to inherency.” *Examiner’s Answer* at 16. *Emphasis added*. Notwithstanding, it was noted above at II.C that the Examiner has failed to establish that the “ceramic” referred to in *Bliesner* (col. 3, lines 8-15) comprises an “emissive” material as required by independent claim 1. As further discussed at II.C, the Examiner has likewise failed to establish that the claimed “emissive” coating is inherent in the disclosure of *Bliesner*. Thus, regardless of whether the rejection of claims 1-2 and 4-10 is styled as a 35 U.S.C. § 102 or 35 U.S.C. § 103 rejection, the reliance of the Examiner on *Bliesner* is unavailing.

In light of the foregoing, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the claims, at least because the Examiner has failed to show that the reference teaches or suggests all the limitations of the claims, and Applicant accordingly submits that the rejection of claims 1-2 and 4-10 should be reversed by the Board.

2. claims 7-10

With regard to the rejection of claims 7-10 under 35 U.S.C. § 102(b), Applicant notes that the Examiner has never established that the “ceramic” referred to in *Bliesner* (col. 3, lines 8-15): comprises an emissivity of “about 0.6 or higher” (claim 7); comprises an emissivity of “about 0.2 or lower” (claim 8); “substantially prevents oxidation of the coated portion of the body at body temperatures of up to about 1450 degrees F” (claim 9); or, “substantially prevents corrosion of the coated portion of the body at body temperatures of up to about 1450 degrees F” (claim 10).

Rather, as discussed at II.C. above, the Examiner appears to be relying on a theory of inherency in asserting that the aforementioned limitations are disclosed in *Bliesner*. Insofar as the Examiner has failed to demonstrate that *Bliesner* discloses the claimed “emissive” coating however, the Examiner has, for at least that reason, likewise failed to demonstrate that the

aforementioned limitations (recited in claims 7-10 depending from claim 1) are inherent in *Bliesner*.

In light of the foregoing, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the claims, at least because the Examiner has failed to show that the reference teaches or suggests all the limitations of the claims, and Applicant accordingly submits that the rejection of claims 7-10 should be reversed by the Board.

E. Issue 6: Whether claims 3, 16 and 20-26 are unpatentable, under 35 U.S.C. §103(a), over *McManus* as applied to claims 1-2, 4-15 and 17-19, and further in view of *Tormey*.

With respect to claims 3, 16 and 20-26, the Examiner has conceded that *McManus* fails to disclose the “...ceramic coating comprising oxide filler.” *Examiner’s Answer* at 17. However, the Examiner goes on to assert that Tormey “...teaches oxide filler for a ceramic which is used to coat a metal substrate can reduce shrinkage and have a low firing temperature ... it would have been obvious to ... add oxide filler to the ceramic coating of *McManus* in order to improve the properties of the ceramic coating such as reduced shrinkage and have a low firing temperature.” *Id.*

1. combination fails to include all claim limitations

At the outset, Applicant notes that as discussed herein at II.B.1, the Examiner has failed to establish that *McManus* explicitly or inherently discloses an “emissive” coating as recited in claims 1 and 20, from which claims 3 and 16, and 21-26, respectively depend. Thus, even if the references are combined in the purportedly obvious fashion, the resulting combination fails to include all the limitations of the rejected claims. For at least this reason, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to claims 3, 16 and 20-26 and the rejection of those claims should accordingly be reversed by the Board.

2. *McManus* and *Tormey* are non-analogous art

The Examiner has noted that *McManus* discloses that “The ceramic coating may be any suitable ceramic for high vacuum environments...” *Examiner’s Answer* at 4. *Emphasis added.* As well, *McManus* further explains that “It is still another object of the present invention to provide an ion pump which includes a high voltage electrical field means for generating positively and negatively charged ions.” The disclosed ion pump includes “A coating of ceramic material 11...[covering] the interior of the ion pump chamber.” *Col. 3, lines 9-12 and 71-73. Emphasis added.* Finally, *McManus* states that voltages in the ion pump chamber can be very high, stating “By placing a continuously high positive voltage, up to 25,000 volts, on the collecting grid 21, the negatively charged ions will be attracted towards the grid...” *Col. 5, lines 31-33; Figure 1. Emphasis added.*

In contrast, *Tormey* is directed to a completely different field of endeavor. Specifically, *Tormey* discloses that “This invention relates to multilayer ceramic printed circuit boards.” *Col.*

1, lines 5-6. *Emphasis added.* As well, *Tormey* explains further that “Suitable oxide fillers ... serve to control the shrinkage and to further modify the TCE.” *Col. 5, lines 64-67. Emphasis added.*

In light of the foregoing, it seems clear that while *McManus* refers to a ceramic coating suitable for use in high vacuum/high voltage environments, *Tormey*, on the other hand, is concerned with the use of ceramics to control shrinkage in printed circuit boards. That is, *Tormey* is not reasonably pertinent to the environment and problems with which *McManus* is concerned. Thus, it is not apparent why a person of ordinary skill in the art would look to the printed circuit board technology of *Tormey* for guidance on “improving” the ceramic coating used in the high vacuum/high voltage ion pump of *McManus*. Inasmuch as these two references are clearly directed to widely disparate fields, Applicant submits that the references constitute non-analogous art with respect to each other, and the rejection of claims 3, 16 and 20-26 based on the purportedly obvious combination of those references should accordingly be reversed by the Board.

**3. there is no reasonable expectation that the allegedly obvious
combination of the purported teachings of *McManus* and
Tormey would prove to be successful**

At least because *McManus* and *Tormey* are non-analogous art, it is not evident that the purportedly obvious combination advanced by the Examiner would provide the asserted benefits of “reduce[d] shrinkage” and “low firing temperature.” See *Examiner’s Answer* at 17.

Moreover, *Tormey* suggests that the ceramics disclosed there have a very limited range of applications. For example, *Tormey* purports to be primarily concerned with “A ceramic mixture of a crystallizable...glass mixed with a non-crystallizing lead-based glass and one or more oxide fillers that forms a fired ceramic that has a TCE compatible with that of kovar.” *Abstract. Emphasis added.* As well, *Tormey* also explains that “Known ceramic compositions do not match the TCE of KOVAR at all temperatures of interest, and thus new ceramic compositions were required for co-firing on KOVAR.” *Col. 2, lines 39-42. Emphasis added.* With respect to the KOVAR material, *Tormey* further discloses that “A preferred support substrate is made from KOVAR...” *Col. 3, lines 4-5.* As a further example, Tables IV-VI of *Tormey* all compare the TCE of the “ceramic composition” with the TCE of Kovar. *Cols. 5 and 6.* Finally, *Tormey* notes that KOVAR has a TCE that may change rapidly in certain

circumstances (col. 2, lines 21-29) and states that “This behavior can be contrasted with other useful support substrates, as shown in Fig. 2.” *Col. 2, lines 30-31. Emphasis added.*

It thus appears that the applicant in the *Tormey* case was largely, if not exclusively, concerned with printed circuit boards that include ceramic coatings on a KOVAR substrate. In light of the apparently limited applicability of the *Tormey* ceramic coatings, and in view of the disparate environments in which the respective *McManus* and *Tormey* ceramics are employed, Applicant submits that it is not at all apparent that incorporation of the oxide fillers of *Tormey* in the ceramic coating disclosed in *McManus* would, or even could, produce the purported benefits asserted by the Examiner. Rather, it would appear that the assertions of the Examiner in this regard are little more than hopeful speculation. This point is discussed in additional detail below.

Applicant notes, further, that the purported benefits that the Examiner has suggested would be realized by the combination of *McManus* and *Tormey* are, in any event, vague and ill-defined. For example, the Examiner has asserted that the inclusion of the oxide filler of *Tormey* in the *McManus* coating would result in “reduced shrinkage” of the *McManus* coating. See *Examiner’s Answer* at 17. However, the Examiner has failed to define what is meant by “reduced” shrinkage. That is, the Examiner has not defined or identified a standard by which any shrinkage attributable to the inclusion of the *Tormey* oxide filler can be compared, such that the occurrence of a reduction in shrinkage resulting from employment of that oxide filler could be ascertained. For example, without knowing what shrinkage, if any, may occur in connection with the employment of the unmodified *McManus* coating, it is unclear how the Examiner can establish that inclusion of the oxide filler of *Tormey* in that coating will necessarily “reduce” any such shrinkage that may occur.

If, by referring to “reduced shrinkage,” the Examiner means to refer to the results purported to be obtained with the *Tormey* oxide filler, Applicant submits that it is not apparent that such a result is necessarily extendible to, or useful for, the *McManus* coating. With particular reference to “shrinkage,” *Tormey* discloses that shrinkage is prevented in “...the x, y directions during firing; the result is that all of the shrinkage occurs in the z direction. Thus, the alignment of the ceramic layers to each other, and the stack to the support substrate, remains undisturbed during firing.” *Col. 3, lines 41-44. Emphasis added.* While this result may be desirable in the context of the *Tormey* devices, the Examiner has failed to establish that the

McManus structures are similar to the *Tormey* devices to the extent that the *McManus* structures would benefit from “reduced shrinkage.” By way of example, it is not apparent that *McManus* employs any sort of “stack,” or multiple “ceramic layers,” such as would implicate potential concerns with respect to shrinkage. In view of these disparities, it is not apparent why one of skill in the art would be inclined to modify the *McManus* coating with the *Tormey* oxide filler.

On a related note, the Examiner has failed to advance any evidence whatsoever that the ceramic of *McManus* is, like the specific ceramic compositions disclosed in *Tormey* (see, e.g., claim 1), amenable to “reduced shrinkage” as a result of the inclusion of an oxide filler. In view of the limited discussion of ceramics in *McManus*, it would appear that, in fact, the Examiner could not make such a showing. At best then, the Examiner has articulated an “obvious to try” rejection, namely, it would be obvious to try incorporating the *Tormey* oxide filler in the unspecified ceramic disclosed in *McManus*. It is well established however, that “obvious to try” is not the appropriate standard upon which to base a determination of obviousness. See, e.g., *In re Geiger*, 815 F.2d 686, 688 (Fed. Cir. 1987) (“At best, in view of these disclosures, one skilled in the art might find it obvious to try various combinations of these known scale and corrosion prevention agents. However, this is not the standard of 35 U.S.C. § 103.”).

Along similar lines, Applicant notes that the Examiner has asserted that the motivation for the purportedly obvious combination “...is clearly provided by Tormey who teaches benefits attributable to the inclusion of oxide filler in a ceramic...” *Examiner’s Answer* at 19. Thus, the Examiner appears to have taken the view that *Tormey* suggests incorporating oxide filler in any ceramic. However, the Examiner has provided no justification for this broad reading of *Tormey*. Moreover, it was noted above that *Tormey* appears to be quite limited in terms of the application of the disclosed ceramics.

Finally, Applicant notes that the Examiner has failed to advance any evidence whatsoever that the ceramic of *McManus* is, like the specific ceramic compositions disclosed in *Tormey* (see, e.g., claim 1), amenable to “reduced shrinkage” as a result of the inclusion of an oxide filler. In this regard, the Examiner has asserted that “...as like materials are used in a like manner, it is expected that the inclusion of oxide filler in a ceramic as taught by Tormey will produce identical properties to inclusion of oxide filler in the ceramic taught by McManus.” *Examiner’s Answer* at 18. *Emphasis added.*

Manifestly, the *Tormey* ceramic is not the same as the *Bliesner* ceramic. Particularly, and as noted above, the *Bliesner* ceramic consists of chromium carbide combined with boron nitride. In contrast, it is not apparent that either of these compounds are even disclosed in *Tormey*, much less in the combination disclosed in *Bliesner*. Thus, the assumption of the Examiner that, notwithstanding the evident differences between the two ceramics, inclusion of the same oxide fillers in each would necessarily produce “identical” results is not well founded and, instead, appears to be little more than unsupported speculation.

For at least the reasons set forth above, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the rejection of claims 3, 16 and 20-26 and the rejection of those claims should accordingly be reversed by the Board.

F. Issue 7: Whether claim 3 is unpatentable, under 35 U.S.C. §103(a), over *Bliesner* as applied to claims 1-2, and further in view of *Tormey*.

With respect to claim 3, the Examiner has conceded that *Bliesner* fails to disclose the “...ceramic coating comprising oxide filler.” *Examiner’s Answer* at 18. However, the Examiner goes on to assert that *Tormey* “...teaches oxide filler for a ceramic which is used to coat a metal substrate can reduce shrinkage and have a low firing temperature ... it would have been obvious to ... add oxide filler to the ceramic coating of *Bliesner* in order to improve the properties of the ceramic coating such as reduced shrinkage and have a low firing temperature.” *Id.*

1. combination fails to include all claim limitations

At the outset, Applicant notes that as discussed herein at II.C, the Examiner has failed to establish that *Bliesner* explicitly or inherently discloses an “emissive” ceramic coating as recited in claim 1 from which claim 3 depends. Thus, even if the references are combined in the purportedly obvious fashion, the resulting combination fails to include all the limitations of the rejected claims. For at least this reason, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to claim 3 and the rejection of those claims should accordingly be reversed by the Board.

2. *Bliesner* and *Tormey* are non-analogous art

Applicant notes that *Bliesner* explains that it is concerned with an “electro-chemical-thermal cell” (col. 1, line 49) having a:

...main cell 1...with a 430 Stainless Steel shell for a main cell inner container 7 surrounding the working fluids. The container is coated on the inside with an electrically insulating ceramic which is also non-wetting and chemically inert relative to the salts and liquid metal. The ceramic coating consists of first a layer of Chromium Carbide applied over the Stainless Steel surface, then a layer of Boron Nitride.

Col. 3, lines 8-16. Emphasis added.

As the foregoing makes clear, the ceramic coating of *Bliesner* includes a number of specialized characteristics which purportedly enable that coating to be, at once, electrically insulating, non-wetting, and chemically inert relative to salts and liquid metal. Further, *Bliesner* discloses that these characteristics are achieved with a ceramic coating that includes chromium carbide and boron nitride.

In contrast, *Tormey* is directed to a completely different field of endeavor. Specifically, and as noted earlier herein, *Tormey* discloses that “This invention relates to multilayer ceramic printed circuit boards.” *Col. 1, lines 5-6. Emphasis added.* As well, *Tormey* explains further that “Suitable oxide fillers ... serve to control the shrinkage and to further modify the TCE.” *Col. 5, lines 64-67. Emphasis added.*

In light of the foregoing, it seems clear that while *Bliesner* refers to a ceramic coating suitable for use in environments that include salts and liquid metal, *Tormey*, on the other hand, is concerned with the use of oxide fillers to control shrinkage of ceramic layers in printed circuit, particularly, printed circuit boards that include a KOVAR substrate. That is, *Tormey* is not reasonably pertinent to the environment and problems with which *Bliesner* is concerned. Thus, it is not apparent why a person of ordinary skill in the art would look to the printed circuit board technology of *Tormey* for guidance on “improving” the ceramic coating used in the electrochemical-thermal cell of *Bliesner*. Inasmuch as these two references are clearly directed to widely disparate fields, Applicant submits that the references constitute non-analogous art with respect to each other, and the rejection of claim 3 based on the purportedly obvious combination of those references should accordingly be reversed by the Board.

3. there is no reasonable expectation that the combination of the purported teachings of *Bliesner* and *Tormey* would prove to be successful.

At least because *Bliesner* and *Tormey* are non-analogous art, it is not clear that the purportedly obvious combination advanced by the Examiner would provide the asserted benefits of “reduce[d] shrinkage” and “low firing temperature.” See *Examiner’s Answer* at 18.

Moreover, and as noted at II.F.3 above, it appears that the applicant in the *Tormey* case was largely, if not exclusively, concerned with printed circuit boards that include ceramic coatings on a KOVAR substrate. In contrast, *Bliesner* refers to specific ceramic coatings, incorporating chromium carbide and boron nitride, and suitable for use in salt and liquid metal environments. In light of the apparently limited applicability of the *Tormey* ceramic coatings, and in view of the disparate environments in which the respective *Bliesner* and *Tormey* ceramics are employed, Applicant submits that it is not at all evident that incorporation of the oxide fillers of *Tormey* in the ceramic coating disclosed in *Bliesner* would, or even could, produce the purported benefits identified by the Examiner, nor is it clear that the *Tormey* oxide fillers could

be employed in the purportedly obvious fashion without impairing the specialized functionality and characteristics of the *Bliesner* coating. It would thus appear that the assertion of the Examiner that the aforementioned benefits would flow from the allegedly obvious combination of *Bliesner* and *Tormey* is little more than hopeful speculation. This point is discussed in additional detail below.

Applicant notes as well that, as discussed above at II.F.3 with respect to the combination of *McManus* and *Tormey*, the purported benefits that the Examiner has suggested would be realized by the combination of *Bliesner* and *Tormey* are similarly vague and ill-defined. For example, the Examiner has asserted that the inclusion of the oxide filler of *Tormey* in the *Bliesner* coating would result in “reduced shrinkage” of the *Bliesner* coating. See *Examiner’s Answer* at 18. However, the Examiner has failed to define what is meant by “reduced” shrinkage. That is, the Examiner has not defined or identified a standard by which any shrinkage attributable to the inclusion of the *Tormey* oxide filler can be compared, such that a reduction in shrinkage resulting from employment of that oxide filler could be ascertained. For example, without knowing what, if any, shrinkage may occur in connection with the employment of the unmodified *Bliesner* coating, it is unclear how the Examiner can establish that inclusion of the oxide filler of *Tormey* in that coating will necessarily “reduce” any such shrinkage.

Finally, and as noted above at II.F.3, the Examiner has failed to advance any evidence whatsoever that the ceramic of *Bliesner* is, like the specific ceramic compositions disclosed in *Tormey* (see, e.g., claim 1), amenable to “reduced shrinkage” as a result of the inclusion of an oxide filler. In this regard, the Examiner has asserted that “...as like materials are used in a like manner, it is expected that the inclusion of oxide filler in a ceramic as taught by *Tormey* will produce identical properties to inclusion of oxide filler in the ceramic taught by *Bliesner*.” *Examiner’s Answer* at 19. *Emphasis added.* However, Applicant submits that the aforementioned assertions by the Examiner are problematic for at least the same reasons set forth at II.F.3 above.

For at least the reasons set forth above, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the rejection of claim 3 and the rejection of that claim should accordingly be reversed by the Board.

III. FORM OF AMENDED BRIEF OF APPELLANT

In the *Examiner's Answer*, the Examiner has alleged that "The brief is deficient because, with respect to claim 11, the claimed coating is an inorganically bonded ceramic, not an inorganically bonded composite." *Examiner's Answer* at 2. Applicant respectfully disagrees.

As noted at paragraph [0053] of the application concerning an example embodiment, "...the cured coating comprises a porous free ceramic composite..." Inasmuch as the claimed "inorganically bonded ceramic" falls within the ambit of a "ceramic composite," the Summary of the Claimed Subject Matter set forth in the *Amended Brief of Appellant* at 5 is believed to comply with the provisions of 37 CFR 41.37(v) and Applicant accordingly submits that, contrary to the assertion of the Examiner, the *Amended Brief of Appellant* is not deficient in this regard, and no further amendment is required.

CONCLUSION

Based on the foregoing, and in view of the arguments previously advanced in *Appellant's Amended Brief*, Appellant respectfully submits that the rejections of the claims are not well taken. Accordingly, Appellant respectfully requests that the Board reverse the Examiner's rejections of claims 1-36 pending in this application and thereby place this application in condition for immediate allowance.

This Reply Brief is

DATED this the 7th day of May, 2007.

Respectfully submitted,

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